1 stepped pressure equilibrium code : ih00aa

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1. Interpolates interface geometry: redundant; The interface geometry is given in `iRbc(0:Nvol,1:mn)` and `iZbs(0:Nvol,1:mn)`, where `iRbc(0,1:mn)` and `iZbs(0,1:mn)` is the coordinate axis.

2. `Lsinterp.eq.0`,

   - the coordinates are constructed by a piecewise linear interpolation of the interface harmonics.
   - The coordinate Jacobian is discontinuous at the interfaces; but, as the Beltrami fields in each volume are constructed independently, a discontinuous Jacobian does not cause any problems.

3. `Lsinterp.eq.1`,

   - the coordinates are constructed by a piecewise cubic interpolation of the interface harmonics, provided by the NAG routine `E01BEF`.

4. `Lsinterp.eq.2`,

   - the coordinates are constructed by a piecewise cubic interpolation of the interface harmonics, where the first derivatives required for the interpolation are constructed by centered differences (except at the origin and outermost boundary, where forward and backward differences are used).
   - this should, in most cases, give identical results to the case `Lsinterp=1`.

5. `Lsinterp.eq.3`,

   - the power r^m is extracted before the piecewise cubic interpolation of the interface harmonics, so that the radial dependence of the coordinate Fourier harmonics is $R_j(s) = s^{m/\beta}p(s)$, where $p(s)$ is a polynomial fitted to the interfaces, i.e. $p(s_i) = R_j(s_i)/s_i^{m/\beta}$, and is interpolated (piecewise-cubic) by the NAG routine `E01BEF`, and it is assumed that the radial coordinate, s, varies like $s \sim r^\beta$.
   - the r^m factor arises from insisting that the coordinates are regular at the origin, as explained in `ex00aa`.
   - note that constructing a suitable value for $p(0)$ is not trivial; his value is set in `ex00aa`.

6. `Lsinterp.eq.4`,

   - the coordinates are constructed by a piecewise cubic interpolation of the interface harmonics, where the first derivatives required for the interpolation are constructed by forward differences (except at the outermost boundary, where backward differences are used).
   - this should, in most cases, give similar results to the case `Lsinterp=1,2`.

7. `Lsinterp.eq.5`,

   - the coordinates are constructed by a piecewise linear interpolation of the interface harmonics, except in the innermost volume, where

   $$R_j(s) = R_{j,1}s^{m_j/2}/s_1^{m_j/2}, \quad Z_j(s) = Z_{j,1}s^{m_j/2}/s_1^{m_j/2}. \tag{1}$$

   - this is probably inconsistent with the location of the magnetic axis as computed by `ex00aa`.

8. In all cases, the radial derivatives of the coordinate harmonics are saved in `Ric(0:Nvol,1,1:mn)` and `Zis(0:Nvol,1,1:mn)`.

ih00aa.h last modified on 2012-05-08 ;